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EXAMINER

LOPEZ, OLVIN

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/591,652	Applicant(s) MARCHESI, MARCELLO	
	Examiner OLVIN LOPEZ	Art Unit 2121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09/05/2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09/05/2009 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☒ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:
2. Page 5 line 22 recites "outlays" it should be changed to --onlays--.

Appropriate correction is required.

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required:

Claim 2 recites the limitation "the emission of electromagnetic radiation **from** said first and second surfaces" in lines2-3. There is insufficient antecedent basis for this limitation in the claim.

Abstract

1. The abstract of the disclosure is objected to because minor informalities.
2. Abstract line 2 recites "steps of." It should be changed to -- steps of: --.
3. Correction is required. See MPEP § 608.01(b).

Claim Objections

Art Unit: 2121

1. Claims 4-7 and 10-17 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim should refer to other claims in the alternative only. See MPEP § 608.01(n). Accordingly, the claims 4-7 and 10-17 have not been further treated on the merits. For purposes of compact examination, limitations in the claims above have been searched and applicant is encouraged to consider such rejections when amending the claims. For purposes of examination and compact prosecution claims will be treated as dependant in the following form

Claim 4 dependant on claim 1

Claim 5 dependant on claim 1

Claim 6 dependant on claim 1

Claim 7 dependant on claim 6

Claim 10 dependant on claim 7

Claim 11 dependant on claim 2

Claim 12 dependant on claim 1

Claim 13 dependant on claim 6

Claim 14 dependant on claim 6

Claim 15 dependant on claim 13

Claim 16 dependant on claim 15

Claim 17 dependant on claim 15

With respect to claims 1, 2, 3, 4, 5, 6, and 7, Claims 1, 2, 3, 4, 5, 6, and 7, recite the limitation "said first surface" and "said second surface" in lines within them. There is insufficient antecedent basis for this limitation in these claims.

2. With respect to claim 4, Claim 4 recites the limitation "said maxilla and said mandible" in line 6. There is insufficient antecedent basis for this limitation in the claim.

3. With respect to claim 7, Claim 7 recites the limitation "for the assisted preparation" in line 6. There is insufficient antecedent basis for this limitation in the claim.

4. Claims 8-9 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim can not depend from any other multiple claim. See MPEP § 608.01(n). Accordingly, the claims 8-9 not been further treated on the merits. For purposes of compact examination, limitations in the claims 8-9 have been searched, applicant is encouraged to consider such rejections when amending the claims.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the

Art Unit: 2121

art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 4, 6, 10, 12, and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With regard to claim 1 line 6, **claim 4** lines 7 and 8, **claim 6** line 4, **claim 10** lines 4 and 7, and **claim 13** line 5, **recites the phrase “and/or” within them.** This phrase makes the claim indefinite because it is subject to more than one interpretation. For the purposes of examination in this application, this term will be interpreted as **“or”**.

With respect to claim 10, Claim 10 recites the limitations “comparing said acquired quantity and/or height respectively with a pre-definable maximum reference value and with a pre-definable minimum reference value; and indicating the straying of said acquired quantity and/or height beyond said maximum and minimum reference values” on lines 4-8. There is insufficient antecedent basis for this limitation in the claim and on the specification. Therefore, the above limitations have not been considered on the merits.

With respect to claim 16, line 3 recites “electronic processing unit and said auxiliary electronic processing unit mutually coincide”. The word **“coincide”** is not

Art Unit: 2121

defined in the specification and has a lot of meanings that when applied to the sentence can lead to different interpretations. Therefore, the broadest reasonable interpretation has been given to this word which is **“To occupy the same relative position or the same area in space”**.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. **Claims 1, 4 and 12-13 are rejected under 35 U.S.C. 102(e) as being anticipated by Kim in (US 20040259057).**

With respect to claim 1, Kim teaches a method for generating and processing images for use in dentistry **(see paragraph [0008])**, characterized in that it comprises the steps of:

acquiring the position of at least one first reference surface **(see fig 3 points Mk1, Mk2 and Mk3)**, associated with a at least one portion of either the upper dental arch or the lower dental arch of a patient, and of at least one second reference surface **(see fig 3 points Mp1, Mp2 and Mp3)**, which is associated with at least one portion of

Art Unit: 2121

the other of said upper and lower dental arches (**see paragraph [0036]**) and/or with a hand-piece operated by a health operator inside the mouth of the patient;

transducing the acquired positions of said first surface and of said second surface into signals to be transmitted to an electronic processing unit, in which CAD software is implemented (**see paragraph [0038]**);

processing, with said processing unit, the transmitted signals in order to generate an image for use in dentistry (**see fig 2 and paragraph [0009] lines 5-11, and paragraph [0038] lines 15-18**) ; and displaying said image on a screen (**see fig 2 element S13 and paragraph [0009] lines 4-5**).

With respect to claim 4, Kim teaches the method according to one or more of the preceding claims, characterized in that said first surface is associated with at least one portion of either said upper dental arch or said lower dental arch and said second surface is associated with at least one portion of the other of said upper and lower dental arches (**see paragraph [0036] and see fig. 3**), in order to generate an image that represents the relative motion between said maxilla and said mandible for gnathological analyses of occlusion and/or of the kinematics/dynamics of mastication and/or for generating a gnathological interarch device and/or if, or integrating the creation of prostheses with correct occlusal adjustment (**see paragraph [0014] and see fig 3 elements a-e**).

With respect to claim 12, Kim teaches the method according to one or more of the preceding claims, characterized in that it comprises storing said images in a memory unit associated with said processing unit **(see paragraph [0039] lines 3-4).**

With respect to claim 13, Kim teaches the method according to one or more of the preceding claims, characterized in that it comprises processing at least the image of said application site and/or the image that represents the relative motion between said maxilla and said mandible in order to generate **(see paragraph [0039] lines 1-5),** with said CAD, the three-dimensional model respectively of said prosthesis and/or of a gnathological interarch device **(see paragraph [0055] lines 1-8 and fig 6).**

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. **Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kim in view of Duret et al (WO 94/00074) as supported by the Derwent abstract).**

Art Unit: 2121

With respect to claim 2, Kim teaches the method according to claim 1, **Kim does not teach** characterized in that said acquisition step comprises the emission of electromagnetic radiation from said first and second surfaces and the reception of the emitted radiation. Duret teaches a system which comprises the emission of electromagnetic radiation from said first and second reference surfaces and the reception of the emitted radiation to determine the coordinate positions of a transmitter in relation to a receiver for the construction of patient's teeth by correlating three dimensional data of human organs for use in dentistry (**see page 2 line 3-20**). It would have been obvious at the time the invention was made to a person of ordinary skill in the art to which said subject matter pertains to have modified Kim's invention and have used a system which comprises the emission of electromagnetic radiation from said first and second reference surfaces and the reception of the emitted radiation **as taught by Duret** to determine the coordinate positions of a transmitter in relation to a receiver for the construction of patient's teeth by correlating three dimensional data of human organs for use in dentistry (**see page 2 line 3-20**).

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kim in view of **Boutoussov et al (US 7461982)**.

With respect to claim 3, Kim teaches the method according to claim 1, **Kim does no teach** characterized in that said acquisition step comprises the emission of electromagnetic radiation toward said first and second surfaces and the reception of the radiation reflected/absorbed by said first and second surfaces. **Boutoussov teaches an**

Art Unit: 2121

illumination device that transmits electromagnetic energy from a source toward target surfaces **(see Col 1 lines 21-26)** and transmit reflected electromagnetic energy from the target surface to the source that can be used as a signal for further analysis **(see Col 2 lines 20-26 and lines 38-38 and Col 5 lines 24-31)** in the dental field. It would have been obvious at the time the invention was made to a person of ordinary skill in the art to which said subject matter pertains to have modified Kim's invention and have used in his acquisition step an illumination device that transmits electromagnetic energy from a source toward target surfaces **(see Col 1 lines 21-26)** and transmit reflected electromagnetic energy from the target surfaces to the source as taught by Boutoussov that can be used as a signal for further analysis **(see Col 2 lines 20-26 and lines 38-38 and Col 5 lines 24-31)** by a microprocessor to detect damage to a surface or detect dental caries **(see Col 7 lines 12-18)**.

Claim 5-6 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim in view of Geng (US 7474932).

With respect to claim 5, Kim teaches the method according to one or more of the preceding claims, **Kim teaches** characterized in that said first surface is associated with at least one portion of either said upper dental arch or said lower dental arch **(see fig 3 points Mp1, Mp2 and Mp3 and see fig 3)**, and Kim does not teach said second surface is associated with a hand-piece of the probe type in order to create a three-dimensional image of the state of said portion before a dental procedure. **Geng teaches** a method where the second reference surface is associated with a hand-piece of the

Art Unit: 2121

probe type that uses a camera to capture the reflectance and records the position of each projected ray by color in the video camera (**see Col 4 lines 16-21**) to be sent to a computer to further process the image data for creating a three-dimensional image of state of said portion, in order to diagnose oral conditions before a dental procedure can be developed (**see Col 4 lines 31-36 and Col 5 lines 21-60 and see fig 1 and see Col 9 lines 37-47 fig 4 elements 420 and 430**). It would have been obvious at the time the invention was made to a person of ordinary skill in the art to which said subject matter pertains to have modified Kim's invention and have used a method where the second reference surface is associated with a hand-piece of the probe type that uses a camera to capture the reflectance and records the position of each projected ray by color in the video camera (**see Col 4 lines 16-21**) **as taught by Geng** to be sent to a computer to further process the image data for creating a three-dimensional image of state of said portion, in order to diagnose oral conditions before a dental procedure can be developed (**see Col 4 lines 31-36 and Col 5 lines 21-60 and see fig 1 and see Col 9 lines 37-47 fig 4 elements 420 and 430**).

With respect to claim 6, Kim teaches the method according to one or more of the preceding claims, characterized in that said first surface is associated with at least one portion of either said upper dental arch or said lower dental arch (**see fig 3 points Mk1, Mk2 and Mk3 and fig. 3**), and **Kim does not teach** said second surface is associated with a hand-piece , of the tool and/or probe type, for generating a three-dimensional image of the application site of a prosthesis, formed in said portion, in order

Art Unit: 2121

to produce said prosthesis. Geng teaches a method where the second reference surface is associated with a hand-piece of the probe type that uses a camera to capture the reflectance and records the position of each projected ray by color in the video camera **(see Col 4 lines 16-21)** to be sent to a computer to further process the image data for generating a three-dimensional image of the application site of a prosthesis, formed in said portion, in order to produce said prosthesis **(see Col 4 lines 31-36 and Col 5 lines 21-60 and see fig 1)**. It would have been obvious at the time the invention was made to a person of ordinary skill in the art to which said subject matter pertains to have modified Kim's invention and have used a method where the second reference surface is associated with a hand-piece of the probe type that uses a camera to capture the reflectance and records the position of each projected ray by color in the video camera **(see Col 4 lines 16-21)** as **taught by Geng** to send said position data to a computer to further process the image data for generating a three-dimensional image of the application site of a prosthesis, formed in said portion, in order to produce said prosthesis **(see Col 4 lines 31-36 and Col 5 lines 21-60 and see fig 1)**.

With respect to claim 14, Kim in view of Geng teaches the method according to one or more of the preceding claims, Kim further teaches characterized in that it comprises processing the image of said application site and of at least one image selected from the group that comprises **(see fig 6 and paragraph [0055])**:
-- the image of the portions of the upper dental arch or of the lower dental arch that are adjacent thereto **(see fig. 6(a)-(e))** ;

Art Unit: 2121

-- the image of the portions of the upper dental arch or lower dental arch that are antagonist thereto;

-- the image of the state of the portion of the upper dental arch or lower dental arch in which it is formed, before the creation of said site;

-- the image that represents the relative motion between the maxilla and the mandible ;

-- the image or images of a database of models of teeth, or others;

in order to create, with said CAD, the three-dimensional model of said prosthesis with a shape suitable to reproduce or modify the occlusal relationship with said adjacent and/or antagonist portions and/or reproduce or modify the state of the portion of the upper or lower dental arch in which said application site is formed prior to the creation of said site.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kim in view of Geng and further in view of Boutoussov et al.

With respect to claim 7, Kim in view of Geng teaches the method according to one or more of the preceding claims, characterized in that said first surface is associated with at least one portion of either said upper dental arch or said lower dental arch and **(see fig 3 points Mk1, Mk2 and Mk3)**, and **Kim does not teach** said second surface is associated with a hand-piece of the tool type for generating a three-dimensional image of the relative position of said hand-piece with respect to said portion

Art Unit: 2121

for the assisted preparation of said application site. Geng teaches a method where the second reference surface is associated with a hand-piece of the probe type that uses a camera to capture the reflectance and records the position of each projected ray by color in the video camera **(see Col 4 lines 16-21)** to be sent to a computer to further process the image data for generating a three-dimensional image of the application site of a prosthesis, formed in said portion, in order to produce said prosthesis **(see Col 4 lines 31-36 and Col 5 lines 21-60 and see fig 1)**. However, Geng does not teach the hand piece is of the tool type. **Boutoussov teaches** a hand piece of the tool type (an illumination device) that transmits electromagnetic energy from a source toward target surfaces **(see Col 1 lines 21-26)** and transmit reflected electromagnetic energy from the target surface to the source that can be used as a signal for further analysis **(see Col 2 lines 20-26 and lines 38-38 and Col 5 lines 24-31)** in the dental field **and for assisted preparation of application site such as cutting, reforming or treating a surface of a patient (see Col 9 lines 28-30 and Col 5 lines 20-23 and Abstract).**

Therefore, It would have been obvious at the time the invention was made to a person of ordinary skill in the art to which said subject matter pertains to have modified Kim and Geng combination and have used a hand piece of the tool type that transmits electromagnetic energy from a source toward target surfaces **(see Col 1 lines 21-26)** and transmit reflected electromagnetic energy from the target surfaces to the source as **taught by Boutoussov** that can be used as a signal for further analysis **(see Col 2 lines 20-26 and lines 38-38 and Col 5 lines 24-31)** by a microprocessor to detect damage to a surface or detect dental caries **(see Col 7 lines 12-18) and for assisted**

Art Unit: 2121

preparation of application site such as cutting, reforming or treating a surface of a patient (see Col 9 lines 28-30 and Col 5 lines 20-23 and Abstract).

Claims 8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim in view of Geng and in view of Boutoussov et al and further in view in view of Mueller et al in (US 6086366).

With respect to claim 8, Kim in view of Geng and further in view of Boutoussov teaches the method according to claim 7, **Kim in view of Geng and further in view of Boutoussov does not teach** characterized in that it comprises the steps of:

defining a first reference axis in said portion for preparing said application site and a second reference axis of said hand-piece;

acquiring the relative position of said second axis with respect to said first axis; comparing the acquired relative position with predefined limit reference positions stored in said electronic processing unit; and

indicating the straying of said acquired relative position beyond said limit reference positions.

Mueller teaches a method that includes defining a first reference axis in said portion for preparing said application site and a second reference axis of said hand-piece (**see Col 5 lines 63-65 establishing a defined position between hand-piece and work-piece or preparation site in a predetermined geometry**), acquiring the relative position of said second axis with respect to said first axis (**see Col 9 lines 22-40 the**

Art Unit: 2121

position between the hand-piece and the work-piece is determined which were positioned at a fixed geometry space or axis), comparing the acquired relative position with predefined limit reference positions stored in said electronic processing unit **(see Col 9 lines 46-50),** and indicating the straying of said acquired quantity and/or height beyond said maximum and minimum reference values **(see Col 9 lines 46-50 and 53-65)** to control a device in the removal process of dental material and to avoid an accidental pulpotomy **(see Col 1 lines 40-50).**

It would have been obvious at the time the invention was made to a person of ordinary skill in the art to which said subject matter pertains to have modified **Kim, Geng and Boutossov's** combination and have used a method that includes defining a first reference axis in said portion for preparing said application site and a second reference axis of said hand-piece **(see Col 5 lines 63-65 establishing a defined position between hand-piece and work-piece or preparation site in a predetermined geometry),** acquiring the relative position of said second axis with respect to said first axis **(see Col 9 lines 22-40 the position between the handpiece and the workpiece is determined which were positioned at a fixed geometry space or axis),** comparing the acquired relative position with predefined limit reference positions stored in said electronic processing unit **(see Col 9 lines 46-50),** and indicating the straying of said acquired quantity and/or height beyond said maximum and minimum reference values **(see Col 9 lines 46-50 and 53-65) as taught by Mueller** to control a device in the removal process of dental material and to avoid an accidental pulpotomy **(see Col 1 lines 40-50).**

With respect to claim 10, Kim in view of Geng and further in view of Boutoussov teaches the method according to one or more of claims 7 to 9, **Geng and further in view of Boutoussov** does not teach characterized in that it comprises:

detecting the amount of material removed by the tool hand-piece from the tooth or osteointegrated implant being worked in said portion and/or the height thereof;

comparing said acquired quantity and/or height respectively with a pre-definable maximum reference value and with a pre-definable minimum reference value; and indicating the straying of said acquired quantity and/or height beyond said maximum and minimum reference values.

Mueller teaches a method that includes detecting the material removed depth by a handheld tool (**see Col 9 line 13-15**), comparing said material removed depth against to a desired and predetermined removal depth (**see Col 9 lines 44-47**), and indicating the straying of said acquired quantity and/or height beyond said maximum and minimum reference values (**see Col 9 lines 46-50**) to control a device in the removal process of dental material and to avoid an accidental pulpotomy (**see Col 1 lines 40-50**). It would have been obvious at the time the invention was made to a person of ordinary skill in the art to which said subject matter pertains to have modified Kim's combination and have used a method that includes detecting the material removed depth by a handheld tool (**see Col 9 line 13-15**), comparing said material removed depth against to a desired and predetermined removal depth (**see Col 9 lines 44-47**), and indicating the straying of said acquired quantity and/or height beyond said maximum and minimum reference

Art Unit: 2121

values **(see Col 9 lines 46-50) as taught by Mueller** to control a device in the removal process of dental material and to avoid an accidental pulpotomy **(see Col 1 lines 40-50)**

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kim, in view of Geng, and in view of Boutoussov et al, in view of Mueller, and further in view of De Jung et al in (US 20020180953).

With respect to claim 9, Kim in view of Geng, and in view of Boutoussov et al, in view of Mueller teaches the method according to claim 8, characterized in that said relative position is defined by the angle of incidence formed by said first and second axes, said limit reference positions being defined by the maximum or minimum breadth of said angle of incidence. **Jung et al** teaches a method where angle of incidence of the position of a probe from a surface defines the relative position of the probe from the surface and limit reference positions being defined by the maximum or minimum breadth of said angle of incidence can be determined based on the intensity of the **to determine the height of the probe from the surface which may be utilized to compensate** for the intensity of the color/optical measurements and/or utilized to normalize color values light **(see paragraph [0184] lines 6-22)**. It would have been obvious at the time the invention was made to a person of ordinary skill in the art to which said subject matter pertains to have modified Kim's combination invention and have used a method where angle of incidence of the position of a probe from a surface defines the relative position of the probe from the surface and limit reference positions being defined by the maximum or minimum breadth of said angle of incidence can be

Art Unit: 2121

determined based on the intensity of the as **taught by De Jung to determine the height of the probe from the surface which may be utilized to compensate** for the intensity of the color/optical measurements and/or utilized to normalize color values light **(see paragraph [0184] lines 6-22).**

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kim in view of Duret and further in view of **Boutoussov et al.**

With respect to claim 11, Kim in view of Boutoussov teaches the method according to one or more of the preceding claims, **Kim does not teach** characterized in that said electromagnetic radiation belongs to the infrared range. **Boutoussov further teaches an** illumination device that transmits electromagnetic radiation where said electromagnetic radiation belongs to the infrared range that can be used in dental hygiene procedures **for cutting, reforming or treating a surface (see Col 9 lines 28-30 and Col 5 lines 20-23 and Abstract).** It would have been obvious at the time the invention was made to a person of ordinary skill in the art to which said subject matter pertains to have modified Kim's invention and have used an illumination device that transmits electromagnetic radiation where said electromagnetic radiation belongs to the infrared range as taught by **Boutoussov** because can be used in dental hygiene procedures **for cutting, reforming or treating a surface of a patient (see Col 9 lines 28-30 and Col 5 lines 20-23 and Abstract).**

Claim 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim in view of Erdman et al (US 5184306).

With respect to claim 15, Kim teaches the method according to one or more of the preceding claims, characterized in that it comprises the steps of: **Kim does not teach,**

transmitting said model of said prosthesis or of said gnathological prosthesis to an auxiliary electronic processing unit in which CAM software is implemented;

extrapolating from said model the coordinates for controlling and actuating an electronically-controlled modeling unit;

and transmitting said coordinates to said modeling unit in order to manufacture said prosthesis or said gnathological prosthesis.

Erdman teaches a method and apparatus where a computer acquires data describing an object and its surroundings, constructs a computer-based three dimensional model of the object from that data, superimposes an ideal geometry on the computer-based model, alters the ideal geometry to fit the form and function required of the reproduction (**extrapolating**), and then guides a milling machine in the fabrication of the reproduction (**see Col 2 lines 57-64 and Col 11 lines 19-21see figs 1 and 12**). It would have been obvious at the time the invention was made to a person of ordinary skill in the art to which said subject matter pertains to have modified Kim's invention and have used a method where a computer acquires data describing an object and its surroundings, constructs a computer-based three dimensional model of the object from that data, superimposes an ideal geometry on the computer-based model, alters

Art Unit: 2121

(extrapolating) the ideal geometry to fit the form and function required of the reproduction and then guides a milling machine (**modeling unit**) in the fabrication of the reproduction **(see Col 2 lines 57-64 and Col 11 lines 19-21see figs 1 and 12) as taught by Erdman** for the automated reproduction of three dimensional objects such as prosthesis and as a result reduce enormously the time to fabricate a dental prosthesis.

With respect to claim 16, Kim in view of Erdman teaches the method according to one or more of the preceding claims, characterized in that **Kim does not teach** said electronic processing unit and said auxiliary electronic processing unit mutually coincide. Erdman teaches that the electronic unit and auxiliary processing unit mutually coincide **(see fig 1 elements 10 and 12).**

With respect to claim 17, Kim in view of Erdman teaches the method according to one or more of the preceding claims, Kim does not teach characterized in that said modeling unit is a unit for milling a block of material. Erdman further teaches said modeling unit is a unit for milling a block of material **(see fig 16, 22, 40 and 41 and see Col 23 lines 35-40)** for the fabrication of the reproduction (prosthesis).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Art Unit: 2121

The reference ***Duret et al US 4742464*** discloses ***method of making a dental prosthesis where three dimensional images are generated and processed.***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to OLVIN LOPEZ whose telephone number is (571)270-7686. The examiner can normally be reached on Mondays thru Thursdays and alternate Fridays from 7:30 A.M. to 5:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady, can be reached on (571)-272-3819. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/O. L./
Examiner, Art Unit 2121

/Albert DeCady/
Supervisory Patent Examiner, Art
Unit 2121

Application/Control Number: 10/591,652
Art Unit: 2121

Page 23